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U.S. DEPARTMENT OF COMMERCE**

**BEFORE THE
SUBCOMMITTEE ON ENVIRONMENT, TECHNOLOGY, AND STANDARDS
COMMITTEE ON SCIENCE
U.S. HOUSE OF REPRESENTATIVES**

April 21, 2006

Good morning, Chairman Ehlers. I am Stephen Brandt, Acting Assistant Administrator for the National Oceanic and Atmospheric Administration (NOAA) Office of Oceanic and Atmospheric Administration and Director of the NOAA Great Lakes Environmental Research Laboratory (GLERL). I appreciate the opportunity to speak to you about how NOAA research is applied to meet user needs through information services and through transition of research to operations, and about NOAA's role in Great Lakes regional collaboration.

THE ROLE OF RESEARCH IN SERVING THE PUBLIC

Research underpins NOAA's science-based mission of understanding and predicting changes in the Earth's environment and conserving and managing coastal and marine resources to meet our Nation's economic, social, and environmental needs. Robust environmental observation, assessment, and prediction capabilities provide the foundation for performing NOAA's mission. Research is the cornerstone on which to build and improve environmental forecasts that can enable ecosystem-based management and provide critical weather and climate information for decision makers and the public.

We ensure NOAA research and services meet the needs of our stakeholders by seeking regular feedback from the research community, operational users, and stakeholders. NOAA scientists and our external partners work together to improve the quality of people's lives and to meet our Nation's economic, social, and environmental needs.

In January of 2005, NOAA released *Research in NOAA: Toward Understanding and Predicting Earth's Environment*, a five-year (FY 2005-2009) plan for integrating research in NOAA. In this report, we examine how NOAA can better understand, monitor, and predict the behavior of Earth's complex natural systems, by working with federal and state agency partners to establish regional observing systems, and working with the international community to build an integrated Global Earth Observing System

of Systems (GEOSS). GEOSS will build on the existing Integrated Ocean Observing System (IOOS) and Global Ocean Observing System (GOOS). The integrated observing and modeling system will, in large part, be defined by and be responsive to local needs.

The five year plan establishes how, in the near term, NOAA's research enterprise will deliver improvements to existing forecasting tools. Additionally, NOAA is developing new observation systems, models, and other assessment tools that will advance environmental forecasting and management in the long term. This plan (available at http://nrc.noaa.gov/Docs/NOAA_5-Year_Research_Plan_010605.pdf) identifies outcomes for the near term and research milestones we will use to measure progress towards achieving those outcomes. The five-year plan also describes how we prioritize research within NOAA, who our partners are, and the mechanisms by which we conduct research.

All NOAA research is targeted for application. There are two forms of applications:

- (1) Information Services: This research is designed to aid decision-making, management, public safety, and environmental and economic sustainability.
- (2) Research to Operations: This research is designed to better serve the public by improving NOAA forecasts, and developing new tools and developing new services

ASSESSING USER NEEDS FOR INFORMATION SERVICES IN THE GREAT LAKES

NOAA's research and extension programs have an established presence within coastal and Great Lakes communities, and we work with our stakeholders to ensure research meets user needs and is accessible to users. As examples, I will describe Sea Grant Extension, Great Lakes Environmental Research Laboratory workshops, and NOAA Remote Sensing Applications in the Great Lakes.

Sea Grant Extension

The National Sea Grant College program serves as a unifying mechanism within NOAA to engage top universities in conducting scientific research to support NOAA's mission. Sea Grant works in every coastal and Great Lakes state to conduct applied research, extension, education, and communication designed to foster science-based decisions about the use and conservation of our aquatic resources. The goal of these activities is to achieve a sustainable environment and encourage the responsible use of America's coastal, ocean, and Great Lakes resources.

Sea Grant's integrated research, education and outreach programs provide resources to address problems identified by coastal residents and businesses, and local, regional, state and federal agencies. Through the Great Lakes region's eight Sea Grant programs (IL-IN, MI, MN, NY, OH, PA, WI and Lake Champlain), NOAA is able to mobilize significant independent science and advice from the academic community in the Great Lakes, on the complete range of issues faced by the region.

To address regional Great Lakes challenges and ensure that the public remains well-informed of regional science and policy developments, Sea Grant has numerous extension agents throughout the region, and two extension agents co-located with GLERL. Through these regional extension agents and the use of modern communications and education tools, the Great Lakes Sea Grant Network ensures that NOAA research immediately gets into the hands of coastal managers, industry, and local officials that require this information for decision making. Tools such as local advisory groups with broad representation, facilitated community meetings, the inclusion of outreach activities with every research project conducted, and technology transfer allow Sea Grant extension agents to take the ‘pulse’ of the user communities on a daily basis and assess their needs. This feedback helps steer NOAA research priorities and research information services. The result is a well-informed society that is able to protect lives and livelihoods, and ensure public safety.

The Sea Grant program also provides resources to researchers and academics allowing them to team up and provide information to the public. As one example, Sea Grant works to educate the community to promote healthy choices with regard to PCB (polychlorinated biphenyl) contamination in fish. For each of the Great Lakes and a majority of their tributaries, there is a fish advisory in place to safely limit consumption of contaminated fish. High-risk groups such as pregnant women, children, and women of child-bearing age should limit consumption of PCB-contaminated fish. Sea Grant provides easily-accessible fish advisory information on PCBs in English, Korean, Spanish, and Polish. Wide distribution of these materials has reached many of the 534,000 people comprising non-English-speaking audiences in Illinois and Indiana. All four translations are included in the “ABCs of PCBs” publication, so that a single version can serve a variety of audiences. These materials are provided in hard copy at all Sea Grant workshops and are distributed to the appropriate communities. The “ABCs of PCBs” is also available free of charge on the IL-IN Sea Grant website (<http://www.iisgcp.org/products/iisg0206.pdf>).

In another example, Pennsylvania, Ohio and New York Regional Sea Grant programs, with additional input from Environment Canada, have developed an extensive education and outreach campaign related to Avian Botulism on the Great Lakes. Public workshops have been conducted on this problem, alternating annually between Pennsylvania and New York. These workshops have served to keep agencies and stakeholders aware of fish and bird kills occurring on the Great Lakes and have resulted in increased research funding on the subject.

Great Lakes Environmental Laboratory Workshops

Communicating with user communities has been integral in setting research priorities at GLERL. For example, in August, 2003, a Great Lakes regional workshop was held at GLERL to assess the region’s ecological forecasting needs. Recognizing that making predictions useful to decision makers is the heart of the ecological forecasting concept,

the workshop's preliminary needs assessment challenged workshop participants to think broadly about the ecological forecasting needs of the coastal constituencies. A December, 2004, report produced from the workshop identified stakeholders' needs for 24 ecological forecasts, and GLERL has set nearly all of its research priorities to meet these needs. As discussed in more detail below, operational systems are now in place to provide ecological forecasts for waves, water levels, circulation, and water temperature. Research is ongoing at GLERL to develop the remaining operational forecasting capabilities.

In November, 2005, GLERL teamed up with the Great Lakes Beach Association, the U.S. Geological Survey (USGS), and Environmental Protection Agency (EPA) to host a Beach Health Workshop in conjunction with the Great Lakes Beach Conference. A primary goal of the conference was to identify concerns and information needs of beach managers and public health officials. Another goal was to define research priorities to address recreational water quality issues in the Great Lakes that lead to beach closures for public health. Finally, the workshop helped forge new cooperation between federal agencies and state, tribal, and local groups concerned with beach health.

The overarching questions for this workshop were: How can NOAA, EPA, and USGS research programs help state and local agencies meet their recreational water quality goals, related specifically to beach closures? And, what tools do the beach managers actually need? The workshop allowed our agencies to ask key questions of a diverse group of stakeholders. With attendees from across the region, we were able to gather information to aid in developing effective strategies to meet the research needs of the Great Lakes Beach Health community. Key findings included:

- A need for more comprehensive and standardized training material for beach managers;
- Better communication networks between state, local and federal agencies;
- More accessibility to real-time beach closing data; and
- A need for a regional data network.

By creating a stronger communication network with the beach health community, NOAA is opening the door for better information management, quicker delivery of available tools and technology, and more efficient resource sharing strategies. The GLERL Center for Great Lakes and Human Health website is being updated to become a central location for health departments, state agencies, beach managers and multiple user groups to check beach conditions throughout the Great Lakes Basin, and learn about current forecasting technologies being developed. This website will become a "hub" for federal, state, and local agencies to obtain information on beach closures.

In addition, GLERL has been working very closely with EPA Region V, USGS, and the Great Lakes Beach Association in developing a strong communication network between local, state, and federal agencies. We participate in monthly or bi-monthly conference calls and distribute information on the BeachNet listserv (<http://www.great-lakes.net/glba/beachnet.html>). BeachNet is an e-mail discussion list that seeks to

facilitate communication between people interested in the improvement of recreational beach water quality in the Great Lakes basin. GLERL is also working with the Great Lakes Human Health Network to disseminate information on current research and forecasting models being developed by GLERL researchers. As the technology is transferred, we plan to host training workshops for beach managers to learn to use forecasting models, in coordination with the Great Lakes Human Health Network. The Great Lakes Sea Grant Network is another means that GLERL is utilizing to increase communication and disseminate information on beach closures.

NOAA Remote Sensing Applications in the Great Lakes

NOAA makes data from its Geostationary Operational Environmental Satellites (GOES) and Polar-orbiting Operational Environmental Satellites (POES) fully and freely available for Great Lakes research and operations. This information is available in near real-time to any person or institution (academic, private sector, etc.) that has an antenna capable of receiving the data directly from NOAA's satellites. This data is also available in near real-time on the internet (<http://www.ssd.noaa.gov>). Additionally, archived satellite data for retrospective analyses are available through the Comprehensive Large Array-data Stewardship System (CLASS), an electronic library of NOAA environmental data (<http://www.class.noaa.gov/nsaa/products/welcome>). To build on current satellite contributions to the Great Lakes region, NOAA's future GOES-R Series and NPOESS (National Polar-orbiting Operational Environmental Satellite System; a partnership with the Department of Defense and the National Aeronautics and Space Administration) will continue these detection capabilities. These satellite data are used by the National Weather Service (NWS) and the private sector to assist in weather forecasting and to protect lives and property in the region.

Another example of meeting user needs with satellite data is NOAA's CoastWatch Program, which processes near real-time satellite data, and makes it available to Federal, State, & local marine scientists, coastal resource managers, and the general public. This nationwide program, initially established through NOAA's Coastal Ocean program in 1987, includes two components: (1) central operations and (2) regional nodes. Central operations, managed by NOAA's National Environmental Satellite, Data, and Information Service (NESDIS), coordinates the processing, delivery, quality control and storage of data products. Six regional nodes are located around the country, hosting equipment and personnel to provide near real-time data distribution and regional scientific expertise to the local user community. The Great Lakes regional node is located at GLERL. Together, central operations and the regional nodes provide for the distribution pathway for CoastWatch data and products. The CoastWatch Great Lakes regional node makes a variety of data and products available to the public on their website (<http://coastwatch.glerl.noaa.gov/cwdata/>). CoastWatch data available on this site includes surface environmental analyses; surface temperature contours; satellite imagery; and in situ data including air temperature and pressure, wind and wave conditions, water level, bathymetry, and weather/meteorological information. One popular CoastWatch website was developed in collaboration with the Great Lakes Sea

Grant Network and Michigan State University (<http://www.coastwatch.msu.edu/>). This site provides up-to-the-minute surface water temperatures for all five Great Lakes — a tremendous resource for commercial and recreational fishers. Lake, regional, and port image charts are updated four times daily and can help recreational and industrial anglers save fuel by pinpointing optimal areas for fishing. Nearly 808,000 Great Lakes surface water temperature images were downloaded from this site over six months during the 2003 fishing season. Through the National Ice Center, a collaborative program among NOAA, the U.S. Coast Guard, and the U.S. Navy, the maritime industry is provided with critical information regarding the extent of sea ice coverage, which is a major navigational hazard for commercial and recreational interests. This information is also available via the internet at <http://www.natice.noaa.gov/products/gl-ches/index.htm>.

TRANSITION OF RESEARCH TO OPERATIONS

NOAA is committed to maximizing the value of its research to society and to meet mission objectives thereby ensuring the successful transition of research to operations. Ensuring successful transitions is allowing NOAA to provide the best, most up-to-date information and services to our stakeholders and users. Below I will highlight some examples of successful transitions from research to operations programs. I would like to highlight here some of the administrative work we have been doing to clarify and aid in this process.

Over the past year, NOAA has taken significant steps to ensure that the transition of research to operations is streamlined. These steps include:

- Formation of a Transition Board (March, 2005);
- Development of a Policy on Transition of Research to Operations (signed May, 2005);
- Development of implementation procedures the new transition policy (December, 2005); and
- Identification of ongoing NOAA research projects for transition (February, 2006).

The Policy on Transition of Research to Application (available at http://www.corporateservices.noaa.gov/~ames/NAOs/Chap_216/naos_216_105.html) was developed in response to the recommendations of a recent NOAA-wide research review by a working group of the NOAA Science Advisory Board. The policy provides a mechanism for systematically reviewing all research annually to identify research to be transferred. The Policy applies to all NOAA research, whether conducted in house or externally, and will facilitate the transition of best available science and cutting-edge technologies from NOAA research to operational status within NOAA.

NOAA's Great Lakes research programs such as GLERL and Sea Grant provide for cutting edge research that leads to the successful transfer of research to operations. Below are some examples of research to operations successes in the Great Lakes region.

Great Lakes Water Level Information and Forecasts

Maritime commerce on the Great Lakes is significant. In 2004, 43.48 million metric tons of cargo passed through the St. Lawrence Seaway, representing a cargo value of \$7 billion. Water levels, currents, meteorological and other data are critical for safe and economically efficient commercial Great lakes shipping. Vessels in the 1,000-foot class forfeit 267 tons of cargo for each inch of reduced draft. Regardless of the cargo type, revenue is significantly affected when ships “light-load” to avoid grounding when accurate water-levels are not available. NOAA provides the information required by the Great Lakes shipping community through the 52 National Water Level Observation Network (NWLON) stations on the Lakes, the Soo Locks Physical Oceanographic Real-Time System (PORTS[®]), and accurate water-level forecasts.

The Great Lakes NWLON stations are a part of NOAA’s National Ocean Service’s National Water Level Program. The Great Lakes NWLON provides real-time water level data to mariners that is updated every six minutes and is available via the internet (<http://glakesonline.nos.noaa.gov/>) or through voice modem. NOAA has also integrated meteorological data from the National Weather Service buoys on the Lakes into the NWLON voice modem access, so that mariners have a single point of access for critical water level and meteorological information.

PORTS[®], a program of NOAA’s National Ocean Service, supports safe and cost-efficient navigation by providing ship masters and pilots with accurate real-time water level, currents, meteorological, salinity, air gap (bridge clearance), and other information required to avoid groundings and collisions. PORTS[®] real-time data is available via the web (http://140.90.121.76/d_ports.html) and telephone voice access (301-713-9596 for Great Lakes station information). The Soo Locks PORTS[®] provides decision support information required to make the critical transit between Lakes Superior and Huron.

Both the NWLON and PORTS[®] systems provide critical environmental data to U.S. port authorities and maritime shippers allowing them to make sound decisions regarding loading of tonnage (based on available bottom clearance), maximizing loads, and limiting passage times, without compromising safety. They are also critical to environmental protection, since marine accidents can lead to hazardous material spills that can destroy ecosystems and the tourism, fishing, and other industries.

While NOAA’s PORTS[®] and NWLON programs work to provide real-time data and information about water levels in the Great Lakes, research conducted at GLERL provides models that are used to provide monthly forecasts of Great Lakes water levels for 6-12 months into the future. Incorporating NOAA’s temperature and precipitation outlooks along with detailed watershed runoff and evaporation models, GLERL’s latest 12 month forecasts have proven accurate within 2 centimeters. These forecasts, which are available at <http://www.glerl.noaa.gov/wr/ahps/curfcst/curfcst.html>, are important to the shipping and fishing (both commercial and recreational) industries for planning purposes.

NOAA forecasts can also be received by ships and boats via NOAA Weather Radio All-Hazards, and through the Digital Marine Weather Dissemination System (DMAWDS), a system the National Weather Service (NWS) operates in the Great Lakes for the specific purpose of disseminating NOAA forecasts to commercial shippers. DMAWDS provides graphic displays of NWS model data for the Great Lakes on a personal computer. Data available for display include barometric pressure, air and sea temperature, wind, and wave height. Data are obtained through the DMAWDS bulletin board, which requires a password for entry. DMAWDS access is available to ships participating in the Voluntary Observing Ships (VOS) program. Through the VOS program, observations are taken by deck officers, coded in a special format known as the ships synoptic code, and transmitted in real-time to NWS. The VOS program operates at no cost to the vessel, with communications charges, observing equipment and reporting supplies furnished by the National Weather Service. To participate, vessels can contact a Port Meteorological Officer; these individuals are located at some NWS offices and serve as liaison for commercial navigation interests.

Great Lakes Coastal Forecasting System

In April, 2006, NOAA announced the completion of the Great Lakes Operational Forecast System (GLOFS) for lakes Superior, Huron, and Ontario. This system, first implemented in Lakes Erie and Michigan in October, 2005, is a NOAA automated model-based prediction system aimed at providing improved predictions (guidance) of water levels, water currents and water temperatures in the 5 Great Lakes (Erie, Michigan, Superior, Huron and Ontario) for the commercial, recreation, and emergency response communities. This system is an excellent example of how NOAA is meeting its mission responsibility through research projects that were developed in NOAA laboratories and are now being transferred to operational use. This forecast system, which is built on 15 years of solid research and testing, will benefit all who use the Great Lakes – be it for recreational or commercial purposes. In addition to supporting critical economic uses, the GLOFS also will enhance efforts to promote public safety by providing better navigational and coastal information to civil authorities and coastal managers involved in search and rescue missions and other emergency response operations.

NOAA's Center for Operational Oceanographic Products and Services (CO-OPS) maintains the GLOFS in an operational environment 24 hours a day, seven days a week providing accurate information needed by this diverse user population in their day-to-day use of the lakes. GLOFS generates hourly "nowcast" guidance (analyses) for present conditions and four times daily forecast guidance (out to 30 hours) of total water level, current speed and direction, and water temperature for each of the Great Lakes. The GLOFS predictions will enable users to increase the margin of safety and maximize the efficiency of commerce throughout the Great Lakes. Both the nowcasts and the forecasts use information generated by a three-dimensional hydrodynamic model that includes real-time data and forecast guidance for winds, water levels, and other meteorological parameters to predict water levels, currents, and temperatures at thousands of locations

throughout the five lakes. Key products include data and animated map plots of water levels, water currents, and water temperatures; these products are available at <http://tidesandcurrents.noaa.gov/ofs/glofs.html>.

Ecosystem Forecasting

NOAA conducts scientific research directed towards creating new tools and approaches for management and protection of coastal ecosystems. To anticipate and minimize how stresses from human and natural causes will affect ecological processes, NOAA is developing ecological forecasting tools which predict the effects of biological, chemical, physical, and human-induced changes on ecosystems and their components. These tools include research on understanding ecological processes, conceptual models of ecosystem function, and statistical and process-driven prediction models. As these tools are developed in the research environment, NOAA scientists identify, consult, and collaborate with user groups representing the ultimate operators and beneficiaries to determine the most useful operational parameters, products, and delivery methods. This often requires the involvement of the operational branches of NOAA (National Ocean Service, National Weather Service, National Environmental and Satellite Data Service, and/or National Marine Fisheries Service) to plan for routine application and dissemination of ecological forecasts. As previously described, public workshops are conducted to identify user needs and services are developed accordingly. This model has been successfully applied by GLERL for forecasts of Great Lakes ice conditions, water levels, circulation and thermal structure, and waves, and is in the process of being applied for beach closures, harmful algal blooms, hypoxia/anoxia, and fish recruitment.

Great Lakes Height Modernization

Height Modernization is a program within NOAA's National Geodetic Survey (NGS) that provides accurate height information by integrating Global Positioning System (GPS) technology with existing survey techniques. For years, GPS has been used to determine accurate positions (latitude and longitude), but now, by following Height Modernization standards, specifications and techniques, GPS can efficiently establish accurate elevations for all types of positioning and navigational needs.

Post-glacial rebound is causing water from the upper Great Lakes to move into the lower reaches of the lakes. NOAA is working with Canada and several states to conduct GPS surveys to monitor the effects of post-glacial rebound on the Great Lakes region. The goal of this collaborative effort is to maintain accurate height relationships between U.S. and Canadian water level gauges to provide valuable information on how this phenomenon will affect water levels. Establishing GPS Continuously Operating Reference Stations (CORS) at water level gauges is part of this effort. A GPS survey organized under the auspices of the International Joint Commission's Great Lakes Coordinating Committee was conducted in 2005, and will provide a more complete picture of vertical change throughout the region. Updated accurate elevations from this

survey are being processed and, when published, will provide vital data to coastal managers, planners, local governments, and others.

Harmful Algal Blooms

The rapid proliferation of toxic or nuisance algae is called a harmful algal bloom (HAB). HABs are scientifically complex and economically significant and can occur in marine, estuarine, and freshwaters. HAB toxins can cause human illness, halt the harvesting and sale of fish and shellfish, alter marine habitats, and adversely impact fish, endangered species, and other marine organisms.

HABs are conservatively estimated to exceed \$1 billion in economic damage over the next several decades while a single HAB event can cause millions of dollars in damages through direct and indirect impacts on fisheries resources, local coastal economies, and public health and perception. In the Great Lakes, NOAA scientists have documented HAB toxin levels that were 10 times higher than the World Health Organization recreational standards and much higher than drinking water standards in some areas. This can result in human health problems.

NOAA is working with its federal partners to organize HAB research around a suite of complementary and interconnected programs and activities that involve a mix of extramural and intramural research, long-term regional ecosystem-scale studies supported by short-term targeted studies, collaborations between academic and federal scientists, and multiple partnerships with Federal, state and tribal managers. An excellent example of this approach is the collaboration between the extramural ECOHAB (Ecology and Oceanography of Harmful Algal Blooms) and MERHAB (Monitoring and Event Response for Harmful Algal Blooms) research programs of the National Ocean Service and NOAA's intramural research laboratories. ECOHAB is a multi-agency partnership between NOAA's Center for Sponsored Coastal Ocean Research (CSCOR) and the National Science Foundation, U.S. Environmental Protection Agency, National Aeronautics and Space Administration, and the Office of Naval Research.

GLERL has been conducting research on HABs for over a decade. The purpose of this research is to assess the causes and consequences of the blooms and to develop bloom forecasting capabilities. This research aims to understand the processes regulating HAB dynamics and provide stakeholder products to help mitigate the impacts of HABs. NOAA modeling expertise is assuring successful development, validation, and demonstration of HAB forecasts to support more effective ecosystem management. These forecasts provide one type of HAB research product that assists coastal managers in better managing our resources and protecting coastal population from potential detrimental effects through the integration of biology, chemical and physical oceanography, and weather information and products.

Sea Grant extension agents, located in every coastal and Great Lakes state, facilitate the flow of HAB information within local and regional communities. In addition, Sea Grant

has supported research focused on the physiology and behavior of individual HAB species and toxins, causes of HABs, and predicting or detecting the occurrence of HABs and their toxins.

The National Ocean Service MERHAB program in the Lower Great Lakes is an 8 campus multi-disciplinary effort to develop monitoring strategies for HABs in Lake Erie, Lake Ontario and Lake Champlain watersheds. This project is also examining the basic science of cyanobacteria and toxin formation. In most cases, cyanobacteria (blue-green algae) are the building blocks for HABs. Proliferations of blue-green algae are often triggered by increases in available nitrogen or phosphorus in the environment. By increasing our basic understanding of cyanobacteria (i.e. basic nitrogen:phosphorus ratios, nutrient uptake rates, growth rates), we should be able to help local managers better predict when conditions are right for bloom formation. Assistance is provided to government and local monitoring agencies through the various campus toxin analysis services.

GREAT LAKES REGIONAL COLLABORATION

On May 18, 2004, President Bush signed an Executive Order that described the Great Lakes as a “national treasure” and sought to improve restoration efforts at the regional and federal levels. The Executive Order established a regional collaboration and promoted agency coordination through a cabinet-level Great Lakes Interagency Task Force. The Department of Commerce is represented on this Interagency Task Force by the Undersecretary of Commerce for Oceans and Atmosphere and NOAA Administrator, VADM Conrad C. Lautenbacher.

In December, 2004, this regional collaborative effort was officially launched in Chicago with the creation of the Great Lakes Regional Collaboration of National Significance (GLRC), a unique partnership of key members from federal, state, and local governments, tribes, and other stakeholders. NOAA is very supportive of this effort. In addition, NOAA is one of the 11 agencies on the Regional Working Group and has an expert on each of the eight strategy teams developed as part of the GLRC. Underpinning the foundation for collaboration in the Great Lakes is the President's U.S. Ocean Action Plan of December 17, 2004, which calls on federal agencies to work together with their partners in state, local and tribal authorities, as well as with the private sector, our international partners and other interests, to make our oceans, coasts, and Great Lakes cleaner, healthier, and more productive. The U.S. Ocean Action Plan specifically calls on the new ocean governance structure established by Executive Order 13366 and supports the Great Lakes Interagency Task Force and Great Lakes Region Collaboration.

The GLRC strategic planning process builds upon extensive past efforts and works toward a common goal of restoring and protecting the Great Lakes ecosystem for this and future generations. “A Strategy to Restore and Protect the Great Lakes” (Strategy) was released on December 12, 2005. Earlier, a draft strategy was released for public

comment and public hearings on the draft strategy were held throughout the Great Lakes region. The final strategy proposes a forward-looking vision to restore and protect the Great Lakes for the benefit of all.

As part of the Administration's response to the Strategy, the Great Lakes Task Force released a list of Near Term Action items that could be initiated over the next two years at present funding levels. NOAA is taking the lead on several items that pertain to the 'Information and Indicator' section of the Strategy. The Great Lakes Task Force list of Near Term Action items identified NOAA as the lead on continued implementation of the U.S. contribution to GEOSS and IOOS in the Great Lakes and coordination of existing Great Lakes National Status and Trends monitoring with other agencies. NOAA's FY 2007 budget request includes \$1.5 million for a Great Lakes Habitat Restoration Program and associated Great Lakes Restoration Office for the mobilization of NOAA's restoration assets to restore Great Lakes aquatic resources and to serve as a focal point for NOAA's restoration efforts in the region. The program will support restoration projects that achieve significant improvement in habitat function and provide community-wide human use benefits, while ensuring appropriate monitoring and feedback. Working with our partners, results will be used to apply lessons learned to other science-based restoration efforts throughout the Great Lakes basin.

CONCLUSION

Mr. Chairman, this concludes my testimony. I thank you for the opportunity to discuss how NOAA meets user needs through information services and through transition of research to operations, and about NOAA's role in Great Lakes regional collaboration. I would be happy to answer any questions you or other Members of the Committee may have.